

Body Weight Overestimation in Adolescents and Its Relationship with Weight Management Behavior

Undergraduate Research Thesis

School of Health and Rehabilitation Sciences

The Ohio State University

April 21, 2015

Grace Reifenberg

Health Sciences

Research Thesis Advisory Committee:

Jill Clutter, PhD, MCHES

Crystal Dunlevy, EdD, RRT

Abstract

Objectives

In the United States, 20 million men and women suffer from a clinically significant eating disorder at some time in their life. The National Eating Disorder Association reports that by age six, girls especially start to express concerns about their own weight. Eating disorders are often associated with adolescents' prior risky behaviors such as poor weight management strategies, as well as inaccurate body image. Early identification of this at-risk population is crucial in order for preventive measures to be successful. Therefore, the purpose of this study is to examine distorted body image (body weight overestimation in normal or underweight adolescents) and the relationship that this outlook has on weight management strategies.

Methods

The population sample came from the 2013 Youth Risk Behavior Survey (YRBS) that was established through the Center for Disease Control as part of their Youth Risk Surveillance System. This is an annual, national survey given to high school students focused on identifying risky behaviors and experiences. This study is a retrospective cross-sectional design and data files were downloaded through the YRBS website and were analyzed using the Statistical Package for Social Sciences (SPSS) for complex samples.

Results

Analysis indicates that 11.1% of high school adolescents overestimate their weight, perceiving themselves to be heavier than they actually are. Of these over-estimators, 82.6% of them are trying to lose weight. In addition, it was discovered that these over-estimators are two to three times more likely to engage in negative weight management behavior, the most prevalent of which was fasting.

Conclusions

This study is important because overestimation of body weight in under or normal weight high school adolescents from high school is related to abnormal weight management. Early identification could help identify at-risk adolescents and aid in early preventive efforts.

Table of Contents

Cover Page -----	1
Abstract -----	2
Tables of Contents -----	3
Chapter 1: Introduction -----	4
Problem Statement -----	4
Review of Literature -----	6
Objectives -----	10
Chapter 2: Methodology -----	11
Population and Sample -----	11
Design -----	11
Data and Instrumentation -----	11
Chapter 3: Results -----	13
Results -----	13
Discussion -----	18
Limitations -----	20
Application to Practice -----	20
Conclusion -----	21
References -----	22

CHAPTER 1

INTRODUCTION

Problem Statement

The existent obesity epidemic in the United States and beyond is a predominant issue in the world today. The Centers for Disease Control and Prevention's National Center for Health Statistics reported that 69.0 percent of adults that are age 20 years and over are overweight or obese (4). In 2007 to 2008, more than one-third of United States adults were obese. Even more alarming, between 1988 to 1994 and 2007 to 2008, the prevalence of obesity among adults increased at all income and education levels (5). In addition to the epidemic of overweight and obese adults, the number of overweight children and adolescents has risen. Approximately 17 percent (or 12.5 million) of children and adolescents aged 2 to 19 years are obese (2). This national epidemic of both adult and childhood obesity has gained considerable public attention.

This combination of health and economic consequences of obese and overweight lifestyles has drastically affected the United States and world. The national epidemic of both adult and childhood obesity has gained considerable public attention. Countless health promotion and government educational programs have been established to combat the obesity epidemic. These programs have been vital in raising awareness and working to fight the world's steeply climbing obesity rates.

While overweight and obesity are garnering considerable media coverage, substantial problems also exist on the opposite side of the weight spectrum. In the United States, 20 million women and 10 million men suffer from a clinically significant eating disorder at some time in their life, including anorexia nervosa, bulimia nervosa, binge eating disorder, or an eating disorder not otherwise specified (3). The National Eating Disorders Association reports that by age 6, girls especially start to express concerns about their own weight and that 40 to 60 percent of elementary school girls are concerned about their weight or becoming too fat (3). This alarming statistic further emphasizes the discordance between society's expectations and reality regarding a healthy body weight. In fact, the average American woman is 5'4" tall and weighs 165 pounds while the average Miss America winner is 5'7" and weighs 121 pounds.

Individuals who suffer from anorexia nervosa or bulimia nervosa both have similar outlooks towards their body weight and shape and are motivated by low body weight. However, there are clear differences between these two disorders. Anorexia nervosa is a serious, potentially life-threatening eating disorder characterized by excessive weight loss due to self-starvation. This extreme weight loss can be attained by various means: self-induced vomiting, excessive dieting and exercising, the ingestion of laxatives, and denial of hunger (3). Anorexia nervosa typically appears in early to mid-adolescence and has one of the highest death rates of any mental health condition. Those who are afflicted by anorexia nervosa typically have a body mass index (BMI) of less than 17.5 and suffer severe health consequences including abnormally slow heart rate, low blood pressure, reduction of bone density, muscle loss and weakness, severe dehydration, overall weakness, dry hair and skin, and the growth of a downy layer of hair called lanugo across the body in an effort to keep the body warm (3).

In contrast to anorexia nervosa, bulimia nervosa is characterized by bingeing and compensatory behaviors such as self-induced vomiting designed to compensate for the effects of binge eating. Symptoms of bulimia nervosa often include frequent episodes of consuming an excessive amount of food followed by behaviors to prevent weight gain, such as self-induced vomiting (3). Additional symptoms include the individual having a feeling of being out of control during binge-eating episodes, as well as self-esteem overly related to their body image. The chance for recovery increases the earlier that bulimia nervosa is detected. Bulimia nervosa affects 1 to 2 percent of adolescent and young adult women (3). Another sign of this condition is that many people struggling with bulimia nervosa recognize that their behaviors are unusual and perhaps dangerous to their health.

Risky behaviors often seen in eating disorders, such as poor weight management strategies, are more prevalent than most realize. These poor weight management strategies range from skipping meals, fasting, and extreme dieting to the use of laxatives and vomiting. These negative weight management strategies are extremely dangerous and can have lasting harmful effects.

Adolescents have been increasingly troubled by eating disorders. The 2013 Youth Risk Behavior Survey found that 62.6 percent of high school females and 33 percent of high school males in the United States were trying to lose weight, 18.7 percent of females and 7.4 percent of males did not eat for 24 or more hours to lose weight or keep from gaining weight, and 6.6

percent of females and 2.2 percent of males vomited or took laxatives to lose weight or to keep from gaining weight (1). Eating disorders occur more often in women than men. Given to the young age of onset of eating disorders, early intervention and prevention is crucial to promote a healthy body image – especially in adolescence.

The purpose of this study is to examine body weight overestimation in adolescents and the effect that this outlook has on weight management strategies. This study will focus on high school adolescents who have an inconsistent body image, perceiving themselves to be heavier than they truly are, and will compare this inconsistency to the adolescent's healthy versus unhealthy weight management strategies.

Review of Literature

In the world today, the beauty industry spends billions of dollars a year convincing individuals that they need to look thinner. This increased focus on outward appearance contributes to a strong body obsession which often leads an individual to try any and all options to lose weight. Body image is the mental representation we create of what we think we look like and is subject to all types of distortion. This strongly influences behavior and leads to a preoccupation with distortions of body image, becoming a driving force in eating disorders.

The Centers for Disease Control and Prevention (CDC) issues the largest public health surveillance system in the United States. The Youth Risk Behavior Surveillance System (YRBSS) monitors six types of health-risk behaviors that contribute to the leading causes of death. The Youth Risk Behavior Survey measures risky behaviors such as: sexual behaviors leading to sexually transmitted diseases and unwanted pregnancies, alcohol and drug use, unhealthy dietary behaviors, and inadequate physical activity. These surveys are representative samples of 9th through 12th grade students, conducted every two years in public and private schools in the United States (5). The 2013 Youth Risk Behavior Survey showed the following significant results: 31.1% of students described themselves as overweight, an increase from the 29.2% who responded in 2011. The prevalence of students describing themselves overweight was higher among females (36.3%) than males (25.9%). The results also showed that 47.7% of students nationwide were trying to lose weight with the prevalence also higher in females (62.6%) than males (33%). Additionally, 13% of students did not eat for greater than 24 hours to lose weight or keep from gaining weight during 30 days before the survey. The prevalence for

females was 18.7% and 7.4% for males. The survey also showed that 5% of students took diet pills, powders, or liquids to lose weight or keep from gaining weight, while an additional 4.4% of students vomited or took laxatives to lose weight or keep from gaining weight (5).

In addition, The National Eating Disorder Association (NEDA) is the leading non-profit organization in the United States which advocates and supports individuals affected by eating disorders. Their research has concluded that 20 million women and 10 million men suffer from a clinically significant eating disorder at some time in their life. Another shocking discovery is that by age six, girls especially start to express concerns about their weight and shape. 40-60% of elementary school girls (aged 6-12) are concerned about their weight. Approximately 1 out of 200 adolescent girls and young women develop anorexia nervosa and out of 100 females, 1-3 will develop bulimia nervosa (3).

Sinead McElhone published the study “Body Image Perception in Relation to Recent Weight Changes and Strategies for Weight Loss in a Nationally Representative Sample in the European Union” with the objective to assess body image perception and satisfaction with current body image. It was designed as a cross-sectional study in which quota-controlled, nationally representative samples of approximately 1000 adults from each country completed a face-to-face interview-assisted questionnaire between March and April 1997. McElhone was surprised at the strong response: only 39% of respondents in the European Union were satisfied with their weight and these were more likely to be male (46%) rather than female (31%). Another important result was that 20% of underweight females wished to be lighter compared to only 5% of males. This study showed clear gender differences in the desire to be thinner with a high proportion of females who were underweight being content to be so (7).

Park published a similar study titled: “Overestimation and Underestimation: Adolescents’ Weight Perception in Comparison to BMI-Based Weight Status and How It Varies Across Socio-Demographic Factors.” This study was created to examine adolescents’ weight perception focusing on how accurate it is in relation to BMI-based weight status. This study was based on 87,418 students from the 2007 Minnesota Student Survey. The results found that weight perception and the BMI-based weight status, based on self-reported height and weight, were strongly and positively correlated *but* substantial discordance was observed with more than a quarter of the students (27.6%) having discordant weight perception. Overall, underestimation

was more prevalent than overestimation but girls were more likely to over-estimate their weight. This is important to note because overestimation can be a risk factor for unhealthy weight-control behaviors. Body image is a very important part of self-representation in adolescence, centered on weight perception (9). Park references a similar study, “Feeling Fat Rather Than Being Fat May be Associated with Psychological Well-being in Young Dutch Adolescents” by W. Jansen, to support her findings. Jansen states that weight perception, rather than self-reported or measured weight, was found to be associated with mental health indicators among teens. The perception of being overweight, although not actually measuring overweight, during adolescence is highly correlated toward weight management and can be a significant risk factor for later eating disorders (10).

Further, Kerri Boutelle’s “Weight Control Behaviors Among Obese, Overweight, and Non-overweight Adolescents” was established to evaluate these often negative weight control behaviors, eating, and physical activity behaviors among obese, over-weight, and non-overweight female and male adolescents. This study was published in the *Journal of Pediatric Psychology* using a representative sample of 8,330 7th, 9th, and 11th grade public school students in Connecticut. Adolescents were asked to respond to questions regarding: weight control behaviors, healthy eating behaviors, breakfast consumption, and vigorous physical activity. Boutelle found that in comparison to non-overweight youth, overweight adolescents were less likely to eat breakfast and less likely to engage in vigorous physical activity than non-overweight youths. In addition, a higher percentage of obese girls engaged in unhealthy weight control behaviors, followed by the over-weight girls and with the lowest level of these behaviors seen in the non-overweight girls. Based on the results of the study, Boutelle concluded that overweight adolescents use more unhealthy weight management strategies and are not engaging in healthier strategies, such as increased physical activity or healthier eating. These findings suggest the need to provide consistent messages about healthy weight loss methods to adolescents (8).

There is additional research on the relationship between weight-control behaviors and the perception of weight seen through Al-Sabbah’s “Weight Control Behaviors among Overweight, Normal Weight and Underweight Adolescents in Palestine: Findings from the National Study of Palestinian Schoolchildren”. In this study Al-Sabah examined the relationship between weight-control behaviors and weight status and the perception of weight in a large, representative

sample of adolescents in the West Bank and Gaza Strip territories of Palestine. This sample consisted of 8,885 male and female students aged 12-18 from 405 randomly selected schools as a part of the 2003/2004 Palestinian Health Behavior in school-aged children study. The results of this study found that in both genders, dieting to lose weight was common among adolescents. Weight-control strategies ranged from healthy behaviors (i.e. dieting and exercise) to unhealthy (i.e. skipping meals, fasting, chronic dieting behaviors) to harmful (i.e. self-induced vomiting, laxatives, and diet pills). There was a high prevalence of abnormal eating patterns and unhealthy weight-control behaviors in adolescents which has become a major public health concern worldwide. Another important finding from this national study is that the perception of being overweight is one reason that adolescents decide to lose weight, regardless if they are truly overweight. Adolescents that perceived their body weight as too fat were much more likely to follow an unhealthy diet. The study indicated that most of the overweight adolescents are motivated to reduce their weight, use unhealthy weight-control behaviors, and engage in disordered eating (11).

In response to the overwhelming amount of recent research on this subject, Ellen Rome's "Children and Adolescents with Eating Disorders" built on previous research to outline issues relevant to the care of adolescent patients with an eating disorder. A special interest group created by the Society for Adolescent Medicine recognized the need to update the state of the art guidelines published in January 2003. Rome's article summarizes newer findings: such as discovering that dieting is the common entry point for anorexia nervosa and bulimia nervosa, with the greatest risk being the group of severe dieters. There are also eating disorders in adolescents that have more favorable outcomes than others. Bulimia nervosa has a more favorable outcome than anorexia nervosa along with a higher discharge weight after hospitalization on average. Rome also emphasized primary prevention combined with early recognition and treatment. These new findings help to decrease morbidity and mortality in adolescents with eating disorders. Rome's research found that dieting is a common entry point for anorexia nervosa and bulimia nervosa, with the greatest risk being the group of severe dieters (6).

The final piece of literature important to consider is the book "I'm, Like, SO, Fat! Helping Your Teen Make Healthy Choices about Eating and Exercise in a Weight-Obsessed

World” by Dr. Neumark-Sztainer. Dr. Neumark-Sztainer does an excellent job of incorporating research to combat society’s hypocritical weight-obsessive culture. The book illustrates that society is full of pressures that promote obesity (i.e. super-size, technology, portion sizes), but rewards thinness. There have been continual increases in eating and weight related problems ranging from obesity to body dissatisfaction, even leading to eating disorders and unhealthy weight control behaviors. This book emphasizes that girls who diet frequently are 12 times more likely to binge eat as girls who don’t diet. A staggering half of teenage girls and a quarter of teenage boys are dissatisfied with their bodies, which could be considered a national epidemic. This book focuses on a major study known as Project EAT which found that 57% of teenage girls have demonstrated unhealthy weight control behaviors, 12% of which are considered extreme weight control behaviors. It also discusses ways to combat this national epidemic including developing and evaluating programs with approaches applicable to teenagers to bring about change, such as: Very Important Kids for elementary boys and girls, Free to Be Me for pre-teen girl-scouts, The Weigh to Eat for high school-aged boys and girls, and New Moves created for high school girls.

Objectives

The purpose of this study is to determine if an overestimation of body weight in under or normal weight adolescents from high school is related to abnormal weight management strategies compared to normal weight students of accurate body weight perception. This could help support with the prevention and early detection of eating disorders. The specific research questions are:

1. Is there a relationship between adolescents having a calculated BMI indicating under or normal weight and the perception of overweight?
2. Is there a difference in the frequency of unhealthy weight management strategies applied by under or normal weight adolescents with overestimated body weight perception compared to normal weight adolescents with accurate body weight perception?

CHAPTER TWO

METHODOLOGY

Population and Sample

The population of this study is male and female adolescents in high school. Eating disorders, such as bulimia nervosa and anorexia nervosa can be devastating to an impressionable, adolescent female. By recognizing these disorders early on, it may alleviate damage and even work to prevent the distressing disorder. The data to be analyzed is taken from the 2013 Youth Risk Behavior Survey (1). The YRBS is a nationally representative study that includes a national school-based survey conducted by CDC and state, territorial, tribal, and local surveys conducted by state, territory, and local education and health agencies and tribal governments. The YRBS monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among youth including: behaviors that contribute to unintentional violence, sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases, alcohol and drug use, tobacco use, unhealthy dietary behaviors, and inadequate physical activity.

Design

This is a retrospective cross-sectional research design where the data is collected one point at a time. The Statistical Package for Social Sciences (SPSS) was used for analysis (13).

Data and Instrumentation

The data being used is from the 2013 administration of the YRBS for high school adolescents in the United States. The CDC has reported the validity of the YRBS instrument self-reported data is consistent with other similar data, and testing of the data may indicate a slight overrepresentation of height and underrepresentation of weight.

The responses to the following YRBS survey questions were exported, reviewed, and utilized for analysis:

(Q2): What is your sex?

(Q3): In what grade are you?

(Q6): How tall are you without your shoes on?

(Q7): How much do you weigh without your shoes on?

(Q66): How do you describe your weight?

(Q67): Which of the following are you trying to do about your weight?

(Q68): During the past 30 days, did you go without eating for 24 hours or more? (also called fasting) to lose weight or keep from gaining weight?

(Q69): During the past 30 days, did you take any diet pills, powders, or liquids without a doctor's advice to lose weight or to keep from gaining weight?

(Q70): During the past 30 days, did you vomit or take laxatives to lose weight or keep from gaining weight?

The responses to these questions were used to obtain the information needed to answer the research questions. In order to classify adolescents as underweight, normal weight, overweight, or obese, questions six and seven were used to calculate the exact BMI. Using the calculated BMI, each adolescent was categorized using the following normative adolescent BMI groupings: underweight = BMI < 5th percentile, normal weight = BMI 5th – 85th percentile, overweight = BMI > 85th percentile, and obese = BMI > 95th percentile (14).

Body perception was determined by the responses to question sixty-six and recoded to: underweight, normal weight, overweight, and obese. Negative weight management behavior was studied using the responses to questions sixty-eight through seventy. Descriptive statistics were used to describe the sample and answer the research questions.

CHAPTER 3

RESULTS

Results

Analysis was done for this study using the 2013 Youth Risk Behavior Survey data. Any adolescent who did not have complete data was excluded from the analysis. The total sample was 12,345 high school adolescents.

Question 1: Is there a relationship between adolescents having a calculated BMI indicating under or normal weight and the perception of being overweight?

The data indicated that of adolescents with a calculated BMI in the underweight category, 72.1% perceived themselves as underweight; 27.1% perceived themselves as normal weight; 0.5% perceived themselves as overweight; and 0.3% perceived themselves as obese. 17.0% of adolescents with a calculated BMI in the normal weight category perceived themselves as underweight; 68.9% perceived themselves as normal weight, 13.2% perceived themselves as overweight, and 0.9% perceived themselves as obese. Those that were placed in the calculated BMI category of overweight, 2.3% of these adolescents perceived themselves as underweight; 41.5% perceived themselves as normal weight; 51.0% perceived themselves as normal weight; and 5.2% perceived themselves as obese. Lastly, of adolescents placed in the obese calculated BMI category 2.8% perceived themselves as underweight; 14.2% perceived themselves as normal weight; 61.4% perceived themselves as overweight; and 21.5% perceived themselves as obese.

Of the total sample of 12,345 high school adolescents, 59.3% had an accurate body perception; 11.1% perceived themselves as heavier than they are; and 29.5% perceived themselves as lighter than they are. Therefore, 11.1% of high school adolescents have an unrealistic body weight perception, seeing themselves as heavier than they truly are.

Accuracy of Body Perception (n = 12,345)

		Actual Weight (BMI)			
		Under-weight	Normal	Over-weight	Obese
Perception of Weight:					
Underweight					
	Count	277	1394	47	50
	Percent (%)	2.2%	11.2%	0.4%	0.4%
Normal Weight					
	Count	104	5668	843	250
	Percent (%)	0.8%	45.7%	6.8%	2.0%
Overweight					
	Count	2	1085	1036	1077
	Percent (%)	0.0%	8.8%	8.4%	8.7%
Obese					
	Count	1	77	105	378
	Percent (%)	0.0%	0.6%	0.8%	3.0%

Weight Perception Accuracy

Accurate Body Perception	59.3%
Perceives Themselves as Heavier Than They Are	11.1%
Perceives Themselves as Lighter Than They Are	29.5%

Based on this data, one in ten high school adolescents (11.1%) has an unrealistic overestimation of their weight. This analysis allowed for the establishment of the relationship between adolescents having a calculated BMI indicating under or normal weight and the perception of being overweight.

Using the adolescent's Weight Perception Accuracy (accurate body perception, perceives themselves as heavier than they are, or perceives themselves as lighter than they are), as well as the responses from question sixty-seven, "Which of the following are you trying to do about your weight," allowed for the comparison of the accuracy of body perception and what the adolescent

is doing to lose weight. Of the adolescents who perceived themselves as lighter than they are (under-estimators), 45.2% were trying to lose weight; 26.6% were trying to gain weight; 14.4% were trying to maintain their weight; and 13.8% were not trying to do anything. Of the adolescents who had an accurate perception of weight, 41.2% were trying to lose weight; 17.3% were trying to gain weight; 21.5% were trying to maintain their weight; and 20.0% were not trying to do anything. In contrast, of the adolescents who perceived themselves as heavier than they are (over-estimators), 82.6% are trying to lose weight. In addition, 3.0% were trying to gain weight; 5.0% were trying to maintain their weight; and 9.3% were not trying to do anything.

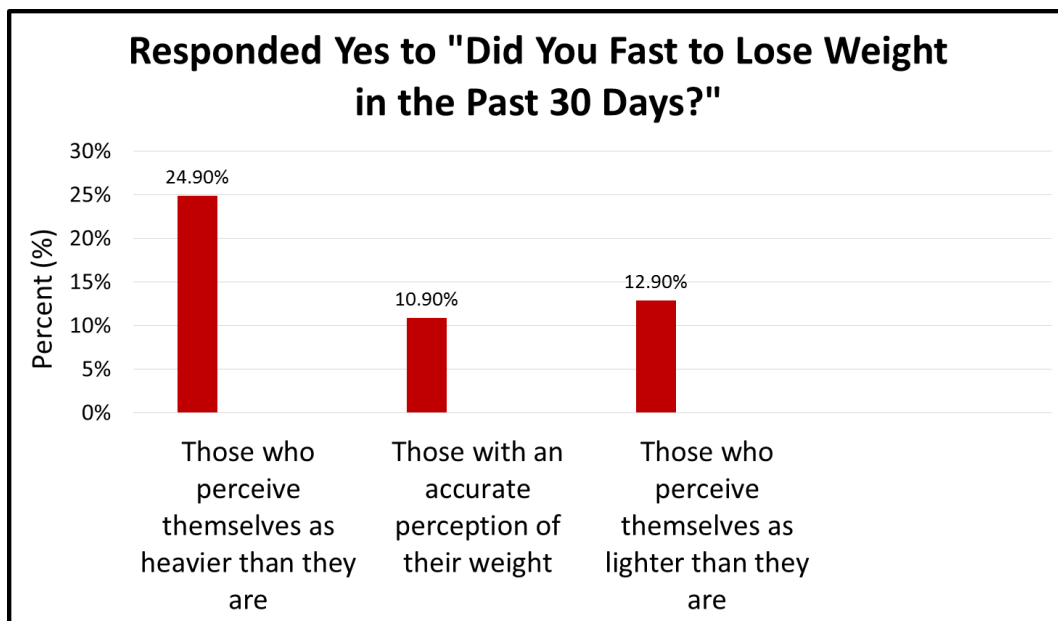
Accuracy of Body Perception By “What Are You Trying To Do To Lose Weight?” (n = 12,345)

	Lose Weight	Gain Weight	Stay the Same	Not Trying to Do Anything
Perceive Themselves as Lighter Than They Are (Under-Estimators)	45.2%	26.6%	14.4%	13.8%
Accurate Perception of Weight	41.2%	17.3%	21.5%	20.0%
Perceive Themselves as Heavier Than They Are (Over-Estimators)	82.6%	3.0%	5.0%	9.3%
		15		

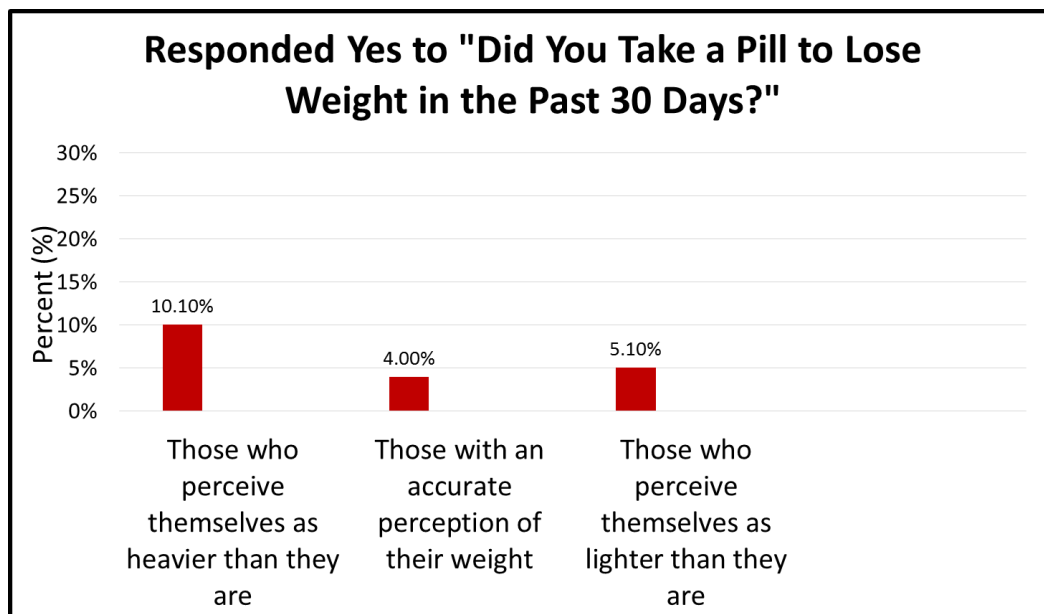
Of the over-estimators, 82.6% of them were trying to lose weight. The amount of over-estimators trying to lose weight (82.6%) is almost twice as much as the under-estimators and accurate body perception categories.

Question 2: Is there a difference in the frequency of unhealthy weight management strategies applied by under or normal weight adolescents with overestimated body weight perception compared to normal weight adolescents with accurate body weight perception?

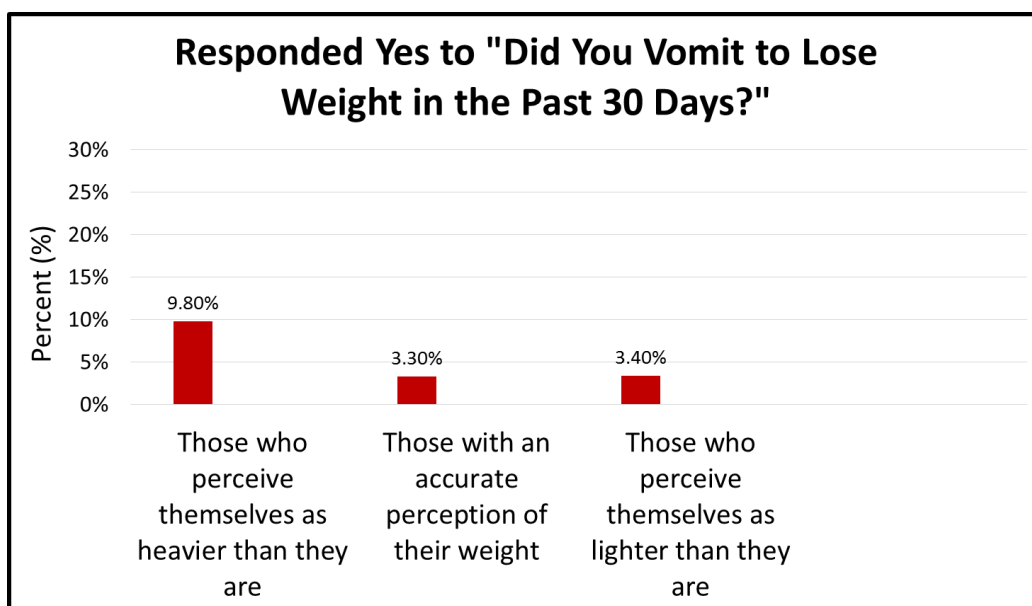
Question sixty-eight, “Did you fast to lose weight in the past 30 days?” was analyzed through a cross-tabulation comparing BMI Grouping by Agreement (Underestimated, Agrees, Overestimated) and the answers yes or no to question sixty-eight. The analysis determined that 12.9% of under-estimators answered Yes to fasting to lose weight in the past 30 days and 10.9% of those with accurate weight perception answered Yes to fasting to lose weight in the past 30 days. In contrast, 24.9% of over-estimators answered Yes to fasting to lose weight in the past 30 days.



Question sixty-nine asks “Did you take a pill to lose weight in the past 30 days?” A cross-tabulation determined that 5.1% of under-estimators answered Yes to taking a pill to lose weight in the past 30 days and 4.0% of those with accurate weight perception answered Yes to taking a pill to lose weight in the past 30 days. It was also determined that 10.1% of over-estimators answered Yes to taking a pill to lose weight in the past 30 days.



Lastly, question seventy asks “Did you vomit to lose weight in the past 30 days?” Based on a cross-tabulation between BMI perception and the adolescent’s response, it was determined that 3.4% of under-estimators answered Yes to vomiting to lose weight in the past 30 days and 3.3% of those with an accurate weight perception answered Yes as well. In contrast, 9.8% of over-estimators answered Yes to vomiting to lose weight in the past 30 days.



In conclusion, the pattern between questions sixty-eight through seventy was consistent. In each instance, adolescents who overestimate their weight were 2-3 times more likely to engage in these three negative weight management behaviors. A chi-squared analysis was run on each question and was statistically significant. ($p = .000$, $p < .05$)

Discussion

This study was able to analyze a national dataset in order to determine if there was a relationship with adolescents who over-estimate their weight and negative weight management behaviors. By regrouping YRBS questions, creating new variables, and using statistical analysis, it was identified that an overestimation of body weight in under or normal weight adolescents in high school is related to abnormal weight management.

There is a fine line between using weight management for positive health effects and disordered, obsessive eating habits. While there are relatively safe and effective weight management strategies, the current study focused on potentially unhealthy strategies, including fasting, diet pills, and vomiting. The calculated BMI categories were compared to the individual's perceived body weight status in order to give a better understanding of how participants view themselves and to determine potential effects.

The first profound result from this study was the discovery that 11.1% of high school adolescents overestimate their weight and further, 82.6% of these individuals are trying to lose

weight. These results mean that more than one in 10 high school adolescents has an unrealistic body image, seeing themselves as heavier than they actually are. Even more concerning, is that of these individuals more than 80% of them are trying to do something about it (lose weight) which could lead to dangerous weight management habits. There are strong implications from this stark discovery. There is a large percentage of adolescents who have an inaccurate body perception and are trying to lose weight as a result. These alarming statistics call for an increase in education of young students regarding a healthier body image to help decrease the risk for dangerous weight management behaviors.

The second major result was that adolescents who think they are heavier than they actually are (over-estimators) are 2-3 times more likely to engage in negative weight management behaviors. All of the weight management strategies evaluated have the intention of aiding weight loss, including fasting, diet pills, and vomiting. Adolescents who think they are heavier than they are were 2-3 times more likely to engage in these behaviors. This is especially alarming for adolescents who are under or normal weight and are continuing to try to lose weight due to their inaccurate weight perception.

The final noteworthy result was that fasting was determined to be the most prevalent weight management strategy. This result has a strong implication as fasting is widely abused and easily concealed. By being aware of this substantial risk for over-estimators, it can allow health care professionals to be especially cognizant and to educate regarding the negative repercussions of fasting and other negative weight management behaviors.

The results of the current study align to the findings of related literature from previous studies. Park's research examined adolescents' weight perception focusing on how accurate it is in relation to BMI-based weight status. This study determined that substantial discordance was observed with 27.6% of students having discordant weight perception (9). These findings compare strongly with the outcome of the current study determining that 11.1% of adolescents overestimate and 29.5% underestimate their weight. These similar conclusions support Park's theory that weight perception, rather than measured weight, is found to be associated with mental health indicators among teens.

Additional literature examined gender differences in the desire to be thinner. McElhone found that only 39% of respondents were satisfied with their weight and of these respondents 46% were male and 31% female (19). In addition, it was discovered that 20% of underweight

females wished to be lighter compared to only 5% of males (19). This literature demonstrates a clear gender difference in the desire to lose weight. In addition, there was initial concern that the current study's data might not be indicative of males versus females, so each gender was analyzed separately. It was determined that the patterns remained the same, but females were using these negative weight management strategies at a greater rate. Males were still much higher than the agreement and underestimating groups, but females use these negative strategies at a much higher rate. While McElhone demonstrated that there is a gender difference in the desire to lose weight, males that do overestimate their weight are still engaged in negative weight management strategies.

Lastly, Boutelle's study concluded that overweight adolescents use more unhealthy weight management strategies as well as are not engaging in healthier strategies, such as increased physical activity or healthier eating (8). The current study was able to illustrate that the use of negative weight management strategies are not predominantly used by overweight adolescents. Rather, adolescents of a under or normal body weight who perceive themselves as overweight are also at a significant risk to engage in unhealthy weight management. These findings suggest the need to provide consistent messages about healthy weight loss methods to all adolescents.

Limitations

The results of this study are limited by a couple of factors. The term "fasting" was not defined and thus leaves it open for interpretation. In addition, the calculated BMI's were based on self-reported height and weight, leaving room for error. Finally, there is still a stigma surrounding disordered eating which could result in these numbers being under-reported.

Application to Practice

This study set out to determine if high school adolescents who over-estimate their weight were more likely to engage in negative weight management strategies. The study showed that there is a large percentage of over-estimators; and further, those who are over-estimating are much more likely to engage in negative weight management behavior. These negative weight management tendencies could lead to disordered eating. It would be beneficial to target high school adolescents in general regarding how to feel comfortable with themselves and to manage weight in a healthy manner. Specifically, it might be helpful to intervene with those who are

over-estimating before they begin engaging in negative weight management strategies. Further research possibilities could include a cross-sectional design or comparing high school versus college-aged students.

Conclusion

The results of this study indicate that high school adolescents who overestimate their weight are much more likely to turn to negative weight management strategies such as fasting, diet pills, or vomiting. These findings are critical because negative weight management behavior strategies are a known precursor to disordered eating. Detecting this relationship can help identify at-risk adolescents and aid in early preventative efforts.

References

1. Centers for Disease Control and Prevention. *2013 Youth Risk Behavior Survey*. Available at: www.cdc.gov/yrbss. Accessed on 8-11-14.
2. Centers for Disease Control and Prevention. *Childhood Obesity Facts*. Available at: <http://www.cdc.gov/obesity/data/childhood.html>
3. National Eating Disorder Association website. Available at: <http://www.nationaleatingdisorders.org>. Accessed on: 8-11-14.
4. Centers for Disease Control and Prevention. *Overweight and Obesity: Causes and Consequences*. Available at: <http://www.cdc.gov/obesity/adult/causes/index.html>
5. Centers for Disease Control and Prevention (2014, March). *Prevalence of Overweight and Obesity Among Adults: United States, 2013-2014*. Retrieved: August 11, 2014, from <http://www.cdc.gov/nchs/fastats/obesity-overweight.htm>
6. Rome, Ellen S. et al (January 2003). "Children and Adolescents With Eating Disorders: The State of the Art." *Official Journal of the American Academy of Pediatrics*, 111 (1), e98-e108.
7. McElhone Sinead et al. "Body image perception in relation to recent weight changes and strategies for weight loss in a nationally representative sample in the European Union." *Public Health Nutrition*, 2(1a), 143-151.
8. Boutelle, K, Neumark-Sztainer, D., Story, M. Resnick, M (2002). "Weight Control Behaviors Among Obese, Overweight, and Nonoverweight Adolescents". *Journal of Pediatric Psychology*, 27. 531-540.
9. Park, E. (2011). Overestimation and underestimation: adolescents weight perception in comparison to bmi-based weight status and how it varies across socio-demographic factors. *Journal of School Health*, G1(2), 57-64.
10. Jansen W, Looij-Jansen P, Wilde E, Brug J. Feeling fat rather than being fat may be associated with psychological well-being in young Dutch adolescents *J Adolesc Health*. 2008; 42(2): 128-136.
11. Al-Sabbah, H.H. Vereecken, C.C. Ziad, A. Kelly, C.C. Ojala, K.K. Nemeth, A.A. &...Maes, L.L. (2010). Weight control behaviors among overweight, normal weight, and underweight adolescents in Palestine: Findings from the national

study of Palestinian schoolchildren (HBSC-WBG 2004). *International Journal of Eating Disorders*, 43(4), 326-336.

12. Beck, L. (2005). "I'm, Like, SO Fat!": Helping Your Teen Make Healthy Choices About Eating and Exercise in a Weight-Obsessed World. *Library Journal*, 130(11), 90.
13. IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
14. About BMI for Children and Teens. (2014, July 11). Retrieved April 14, 2015, from http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html